Installation Manual

EN-6xxW-xx Series

Woofer/Subwoofer Enclosure

Document # 540027

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Document Revision History

Rev. Level	Date	Description
IR	04/1998	Initial Release
A	01/1999	Update to include all drawings to EN-600W series
B	03/2004	Format Update, added photos, updated outline drawings, added metric units to reference drawings.

Reference Documents

Document #	Description
521441 Rev IR	EN-600W-xx Speaker
521916 Rev IR	Outline drawing, EN-601W-xx
521917 Rev IR	Outline drawing, EN-602W-xx
521918 Rev IR	Outline drawing, EN-604W-xx
521882 Rev A	Outline Drawing EN-607W-x, -xx
521908 Rev IR	Outline drawing, EN-608W-xx
521909 Rev IR	Outline drawing, EN-609W-xx
521910 Rev IR	Outline drawing, EN-610W-x
521919 Rev IR	Outline drawing, EN-611W-x
521920 Rev IR1	Outline drawing, EN-612W-x
520954 Rev IR1	Speaker Enclosure EN-620W-xx
522148 Rev IR	Outline drawing, EN-621W-x
520757 Rev IR	Sub-Woofer, EN-646W-xx

Service Bulletin List

Service Bulletin #	Subject	Manual Revision	Revision Date

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EN-6xxW-xx Series

Woofer/Subwoofer Enclosure

1.0 General Information

1.1 Introduction

1.1.1 This manual contains information for the proper installation of Audio International's (AI) Woofer/Subwoofer Enclosures, Model Numbers:

EN-600W-xx	EN-608W-xx	EN-620W-xx
EN-601W-xx	EN-609W-xx	EN-621W-xx
EN-602W-xx	EN-610W-xx	EN-646W-xx
EN-604W-xx	EN-611W-xx	
EN-607W-xx	EN-612W-xx	

Note that the EN-650W-01-x has its own separate Installation manual, number 540246.

1.1.2 Information contained within this publication includes relative physical, mechanical, and electrical characteristics. Also included within this publication of the units. The "-xx" in the product model number designates the speaker resistance and connector type. See Section 3.6 for a breakdown of drivers and power ratings of individual subwoofers.

1.1.3 These speaker enclosures are built to rugged aircraft standards and are easily incorporated into new or existing systems. Features include lightweight construction, integral mounting hardware, and the latest in speaker technology.

1.2 Purpose of the Equipment

The EN-6xxW-xx Series are high quality speakers that feature durable, lightweight aluminum enclosures with solid welded seams and acoustic damping for clean sound with no "buzz" or vibration. Specialized acoustic engineering packs maximum performance into the most compact enclosures possible. All woofer / subwoofer enclosures include grills with optional crossovers available.

1.3 Optional Equipment

Audio International, Inc. offers a comprehensive family of Cabin Control Modules for PC interface. These modules provide convenient solutions for a variety of frequently encountered interfacing needs or special requirements and are an important part of AI's "building block" system for configuring total cabin management.

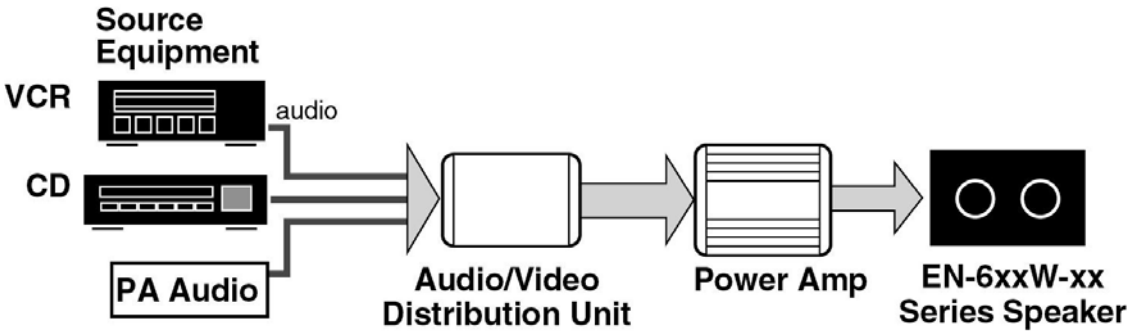
Contact your AI representative for details.

2.0 Application

2.1 Introduction

The EN-6xxW-xx Series speaker enclosures incorporate the latest in subwoofer design technology. Solid welded seams and acoustic damping are provided for clean sound with no "buzz" or vibration. Specialized acoustic engineering packs maximum performance into the most compact enclosure possible. Power ranges from 60 to 100 WRMS, depending on the unit selected; see Section 3.6 for details. All models except for the EN-646W-xx have options of either 4 or 8 Ω impedance (EN-646W-xx has 4 Ω impedance). A connector or pigtail with connector option is available.

2.2 Block Diagram -Typical Application



3.0 Installation

3.1 Prior to Installation

The EN-6xxW-xx Series speakers are simple modules to install. Prior to installation the following items should be considered:

3.1.1 During the design and layout of the aircraft cabin, careful consideration of the location of this and all other audio/video modules is necessary. Some of the items to consider include:

- Space
- Proximity to other devices (i.e. source equipment)
- Environmental conditions (temperature, humidity, etc.)
- Location of other aircraft systems (i.e. oxygen delivery)
- Access for service repair (if applicable)
- Convenience for user interface (if applicable)

3.1.2 The EN-6xxW-xx Series speakers shall be installed to conform to the standards designated by the customer, installing agency, and existing conditions as to the unit location and type of installation.

3.2 Unpacking and Inspection

3.2.1 Carefully open the packaging and remove the speaker. Verify that all components have been included in the package per the packing list. Inspect the unit for shipping damage.

3.2.2 If damage has occurred during shipping, a claim should be filed with Audio International WITHIN 24 hours and a **Return Request Authorization Number** shall be obtained from AI. Refer to the front cover of this manual for address and telephone number of Audio International, Inc. Repackage the unit in its original packaging materials and return it to AI following instructions given by the AI representative. If no return is necessary, retain the packing list and the packing materials for storage.

3.3 *Cautions and Warnings*

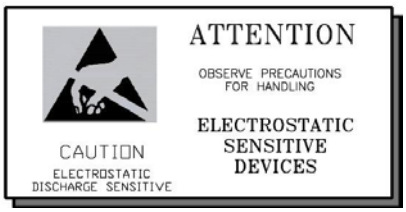
3.3.1 It is important to do a pin-to-pin power and ground check on all connectors. Ensure that Audio Input + and Audio Input - are applied only where specified. Damage to the unit may result if power or ground is applied to the wrong points.

3.3.2 **DO NOT** remove any factory-installed screws. Damage to the unit(s) may result and void any warranties.

3.3.3 **DO NOT** install near heat sources such as direct sunlight, warm air exhausts, or heaters.

3.3.4 **No** scheduled maintenance is required to ensure continued airworthiness.

3.3.5 **ESD** (Electro Static Discharge) guidelines shall be followed.



3.4 Wiring Requirements

3.4.1 The installing agency shall supply and fabricate all external cables and connectors. Length and routing of external cables should be carefully planned before attempting installation of the equipment. Allow adequate space for installation of cable and connectors.

3.4.2 Ensure that all signal wires are 18 AWG minimum (16 AWG recommended).

3.5 Physical Characteristics

3.5.1 The speaker shall be located away from heat sources, magnetic fields, direct sunlight, and areas with excessive dust. The unit shall **NOT** be mounted to the skin of the aircraft.

3.5.2 Refer to 6.0 for unit dimensions and mounting hole sizes.

3.5.3 The unit shall be rigidly mounted to its location using the appropriate fastening hardware supplied by the installing agency.

3.5.4 When mounting the unit to the aircraft's frame, allow sufficient space for mating connectors.

3.5.5 Do not remove the speaker from the enclosure; the speaker is sealed in place to provide optimum performance.

3.5.6 Audio International recommends not restricting airflow in front of the enclosure. Coverings or grills not specifically designed for loudspeaker performance may cause unacceptable loss of sound quality.

3.6 Electrical Characteristics

Model	Drivers	Power	Impedance
EN-600W-xx	AI-612 6.5"	60 WRMS	4 or 8 Ω
EN-601W-xx	AI-620 6.5"	100 WRMS	4 or 8 Ω
EN-602W-xx	AI-612 6.5"	60 WRMS	4 or 8 Ω
EN-604W-xx	AI-612 6.5"	60 WRMS	4 or 8 Ω
EN-607W-xx	AI-620 6.5"	100 WRMS	4 or 8 Ω
EN-608W-xx	AI-612 6.5"	60 WRMS	4 or 8 Ω
EN-609W-xx	AI-612 6.5"	60 WRMS	4 or 8 Ω
EN-610W-xx	AI-612 6.5"	60 WRMS	4 or 8 Ω
EN-611W-xx	AI-620 6.5"	100 WRMS	4 or 8 Ω
EN-612W-xx	AI-612 6.5"	60 WRMS	4 or 8 Ω
EN-620W-xx	AI-612 6.5"	60 WRMS	4 or 8 Ω
EN-621W-xx	Infinity	100 WRMS	4 or 8 Ω
EN-622W-xx	Infinity	100 WRMS	4 or 8 Ω
EN-646W-xx	AI-612 6.5"	100 WRMS	4 Ω

3.7 Mating Connector Information

Model Number	Manufacturer	Mating Connector
-4 or -8	ITT Cannon	MS3122E10-6S
-4P or -8P (12" Pigtail)	AMP	1-480699-0 Receptacle 350689-1 Socket

The enclosures utilize one of two connectors; a two-pin Amp on 12" Pigtail or ITT Cannon connector. Refer to individual options available upon purchase. *Exception: EN-646W-xx utilizes* **MS3476L** *only.*

3.8 Pinout Assignment and Descriptions

EN-6xxW-xx Series	
Pin #	**Description**
1	Audio Input +
2	Audio Input -

3.9 Post-Installation Test

Verify all connections to the unit(s) are making contact. With the aircraft power ON, test the speaker's performance with any properly connected audio unit.

4.0 Troubleshooting

4.1 Introduction

Most functional problems will be detected during the post installation test; refer to Post-Installation Test, Section 3.9. Once the unit has passed these tests, it can be functional for many years of service. Most problems with sound quality are not due to subwoofer performance, but instead are caused by source equipment or faulty audio material. Always check source equipment and audio material as well as the speaker in question.

NO scheduled maintenance is required to ensure continued airworthiness. EN-6xxW-xx has no customer-serviceable parts. If the unit does not work properly, it should be removed and replaced. Contact Audio International for details.

4.2 General Troubleshooting Procedures

- Recheck all connections to the unit for security. Check all harness runs for possible pinching and all pinouts for application accuracy.

The following troubleshooting procedures apply to the equipment supplying audio to the subwoofers and not to the subwoofers themselves.

- Reset by removing power from the unit for at least one (1) minute and reapply power.
- To verify power to the unit, recheck +28 VDC power is applied to the proper pins on the unit. Use a voltmeter to verify correct level.
- To check data bus integrity, utilizing a voltmeter, oscilloscope, or other voltage instrument, verify proper input voltage on the data bus pins. Typical measurements with no device(s) on bus transmitting are as follows:

  A-to-Ground : 4.0 to 4.5 VDC
  B-to-Ground : 0.1 to 1.0 VDC

  If any device is transmitting (i.e., holding bus active), then these typical measurements would be reversed for the A-to-Ground and B-to-Ground measurements. This troubleshooting tool can help indicate a data bus lockup. If this occurs, remove the data bus from all other equipment one piece at a time. As each is removed, check the bus status to see if it is now functioning properly. Once you have removed the piece or pieces of offending equipment, disconnect power and then reconnect everything but the suspect component, reapply power and test the functionality of the unit.

- The RS-485 data bus is a bi-directional bus that does not have a 'bus controller'. The bus uses a differential digital signal that will transmit only when commands are entered via switch selection or other system synchronizing commands. The "A" leg of the bus is HI and the "B" leg LOW.

4.3 Troubleshooting Chart

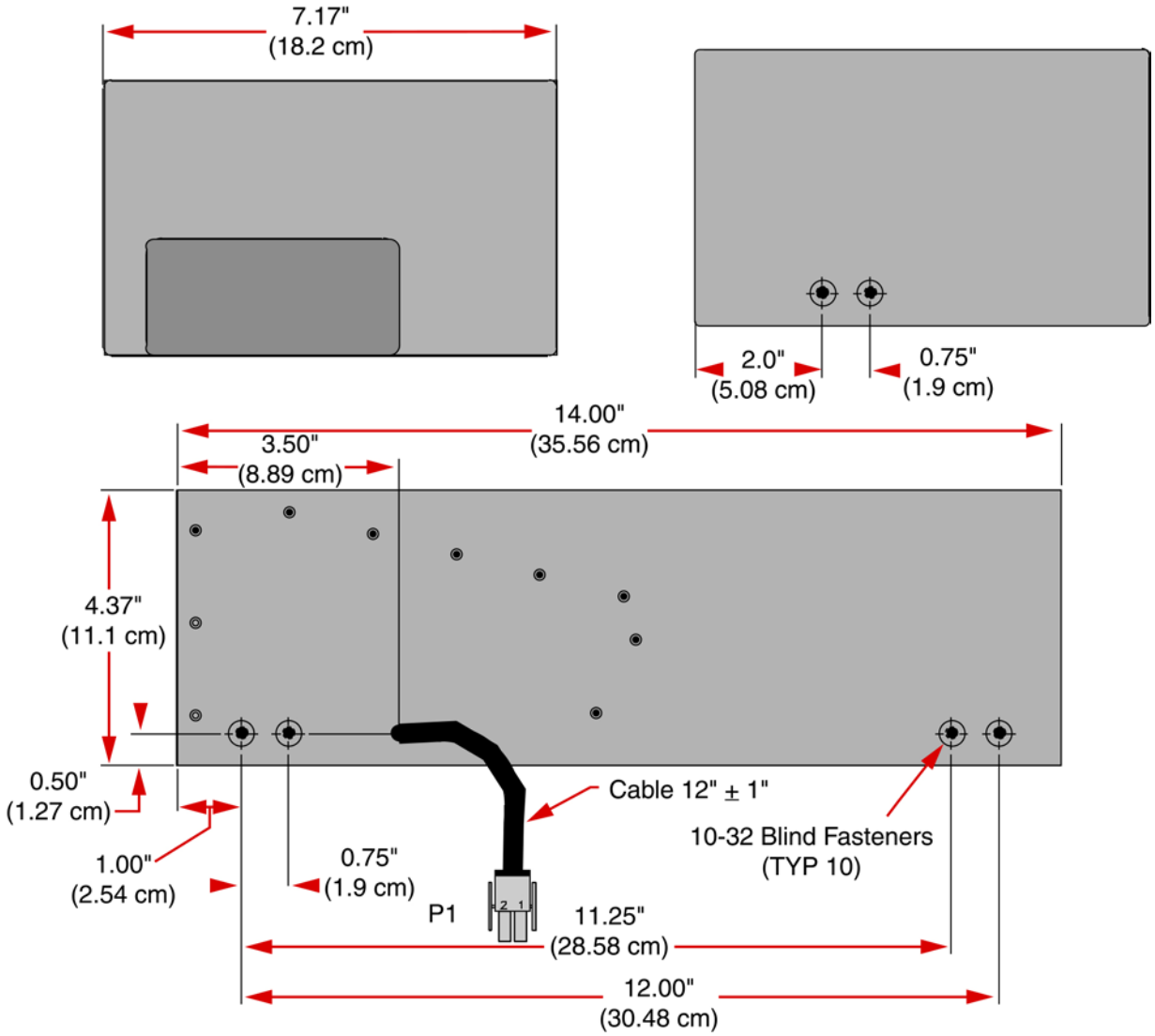
Problem	Possible Cause	Solution
Speaker produces no sound	➢ Unit improperly installed	• Check all connections. Replace connectors if required. Verify that any source equipment is installed correctly.
	➢ Source equipment not loaded with audio material	• Load source equipment with material.
	➢ Source equipment not turned on	• Turn on source equipment.
Speaker does not produce high-quality sound	➢ Using dirty or damaged audio material	• Replace with clean, undamaged material.
	➢ Interference from outside source	• Run wire away from interfering sources.
	➢ System not properly aligned	• Correctly realign system.

5.0 Specifications

Physical Specifications					
Model	**Housing**	**Length**	**Width**	**Height**	**Weight**
EN-600W-xx	Sealed Aluminum	14.0" (36 cm)	7.17" (18.2 cm)	4.37" (11.1 cm)	5.7 lb (2.6 kg)
EN-601W-xx	Sealed Aluminum	12.0 " (30.5 cm)	7.5" (19 cm)	7.5" (19 cm)	9.1 lb (4.1 kg)
EN-602W-xx	Sealed Aluminum	16.0" (40.6 cm)	7.5" (19 cm)	3.5" (8.9 cm)	5.8 lb (2.6 kg)
EN-604W-xx	Sealed Aluminum	12.0" (30.5 cm)	10.0" (25.4 cm)	4.0" (10 cm)	5.8 lb (2.6 kg)
EN-607W-xx	Sealed Aluminum	16.0" (40.6 cm)	7.5" (19 cm)	4.32" (11 cm)	8.5 lb (3.9 kg)
EN-608W-xx	Sealed Aluminum	10.0" (25.4 cm)	7.0" (18 cm)	3.5" (8.9 cm)	5.9 lb (2.7 kg)
EN-609W-xx	Sealed Aluminum	14.0" (36 cm)	9.83" (25 cm)	3.75" (9.52 cm)	6.3 lb (2.9 kg)
EN-610W-xx	Sealed Aluminum	14.0" (36 cm)	9.83" (25 cm)	3.75" (9.52 cm)	6.3 lb (2.9 kg)
EN-611W-xx	Sealed Aluminum	12.0" (30.5 cm)	7.5" (19 cm)	6.5" (17 cm)	8.5 lb (3.9 kg)
EN-612W-xx	Sealed Aluminum	10.0" (25.4 cm)	10.0" (25.4 cm)	3.75" (9.52 cm)	5.8 lb (2.6 kg)
EN-620W-xx	Sealed Aluminum	12.0" (30.5 cm)	7.0" (18 cm)	3.5" (8.9 cm)	5.7 lb (2.6 kg)
EN-621W-xx	Sealed Aluminum	16.0" (40.6 cm)	7.5" (19 cm)	4.35" (11 cm)	4.75 lb (2.15 kg)
EN-646W-xx	Sealed Aluminum	14.0" (36 cm)	7.17" (18.2 cm)	4.37" (11.1 cm)	5.7 lb (2.6 kg)

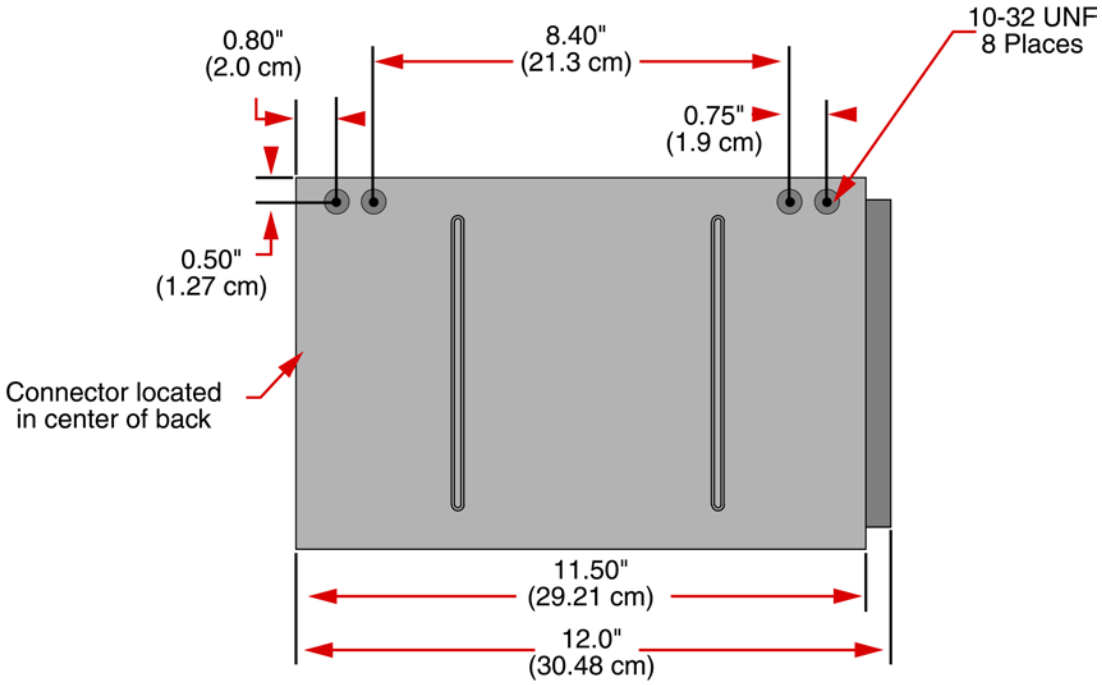
6.0 Reference Drawings

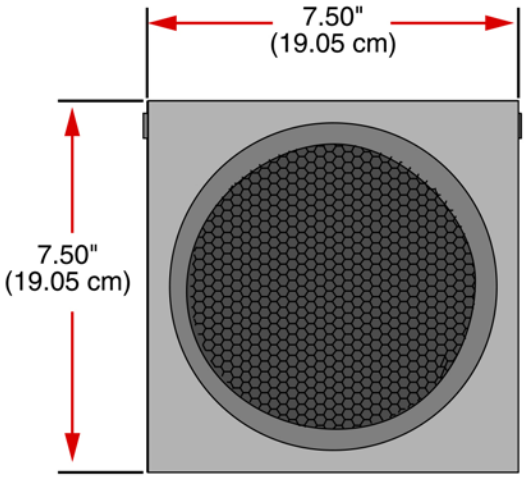
6.1 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-600W-xx.



EN-600W-xx

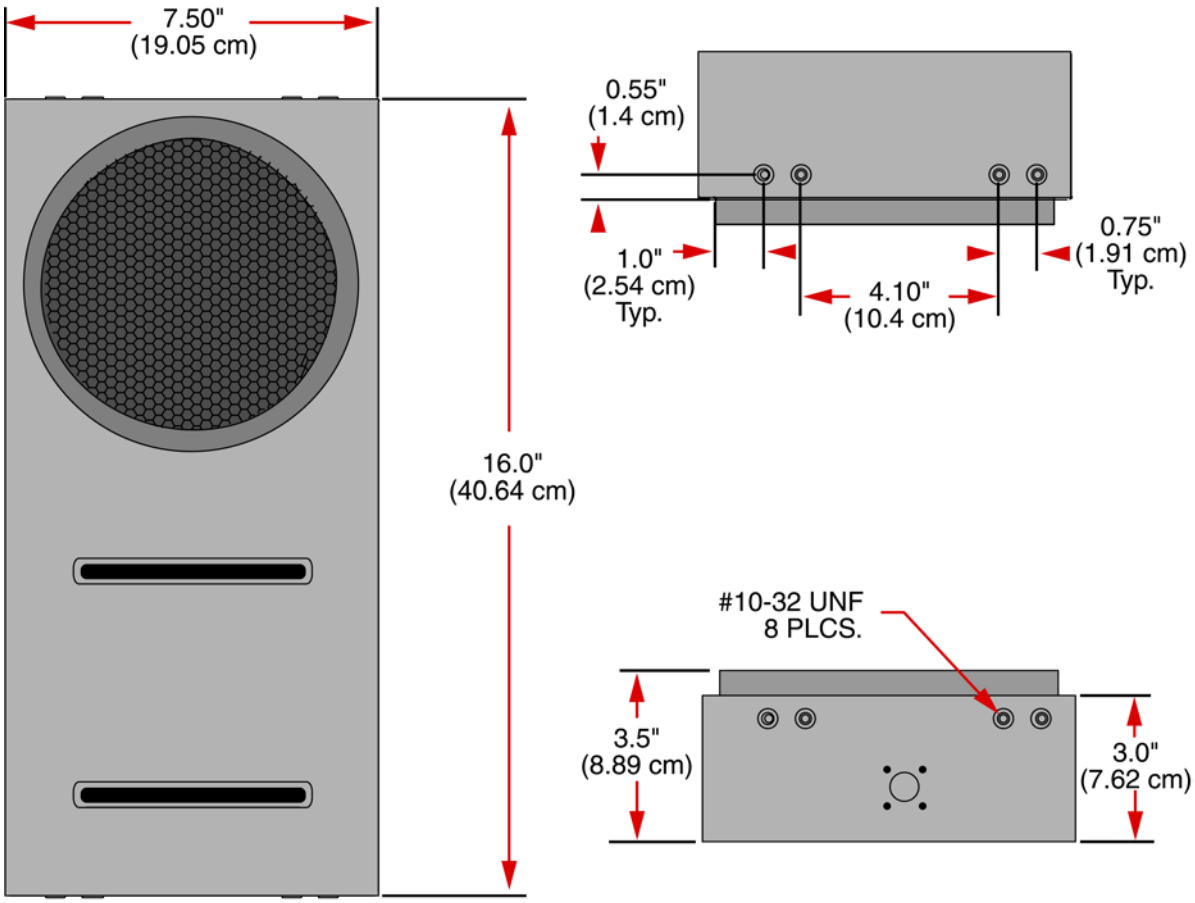
6.2 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-601W-xx.





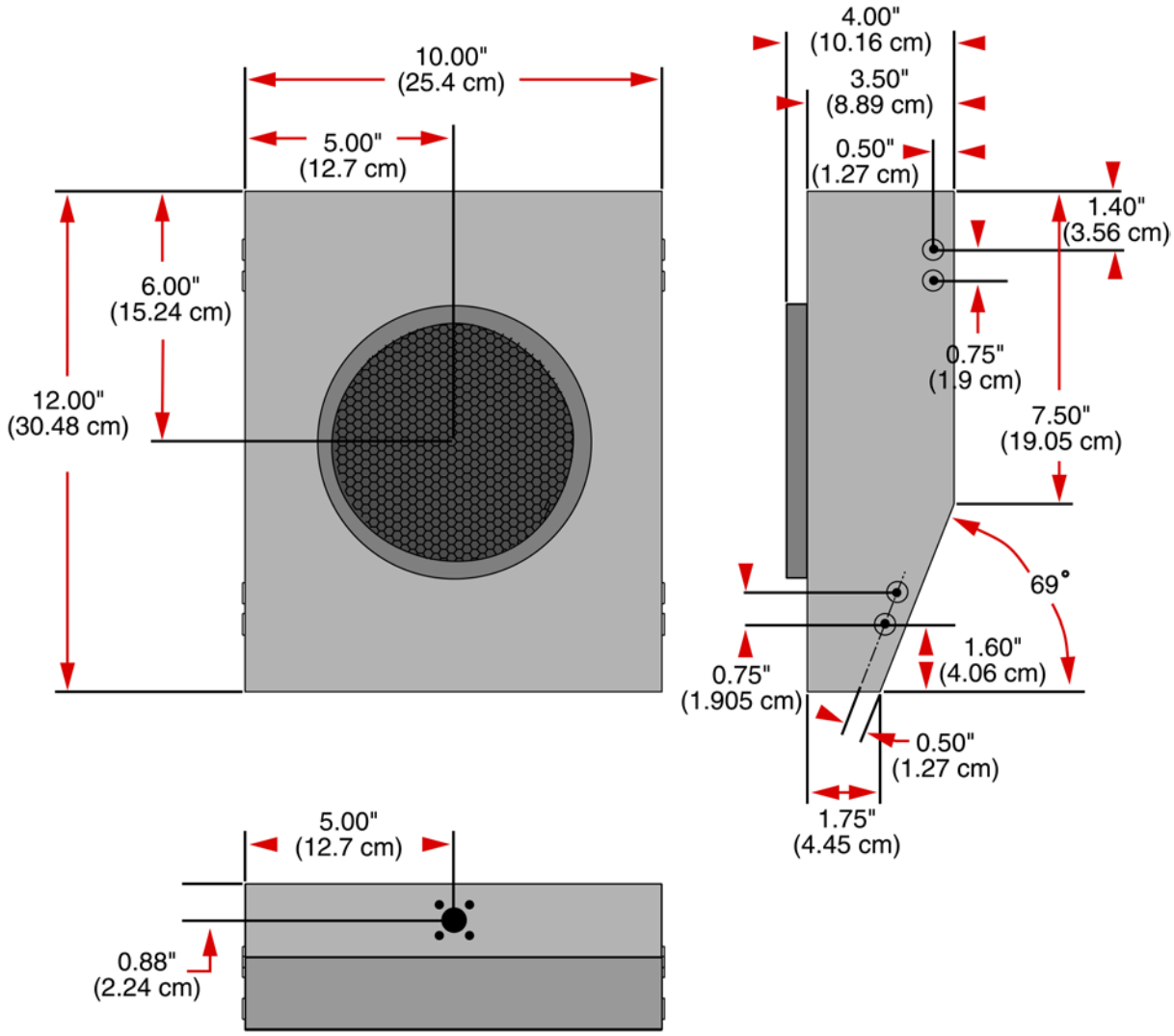
EN-601W-xx

6.3 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-602W-xx.



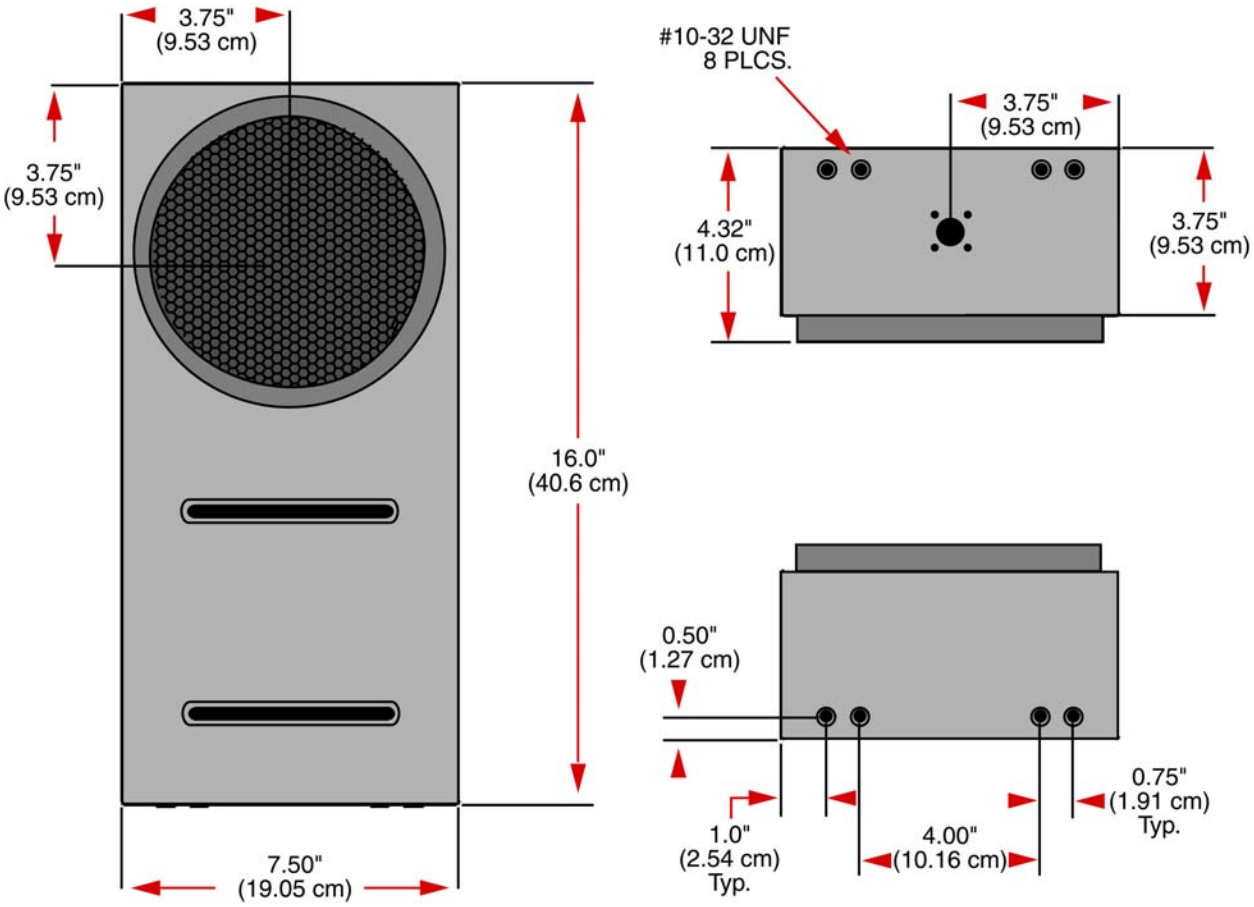
EN-602W-xx

6.4 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-604W-xx.



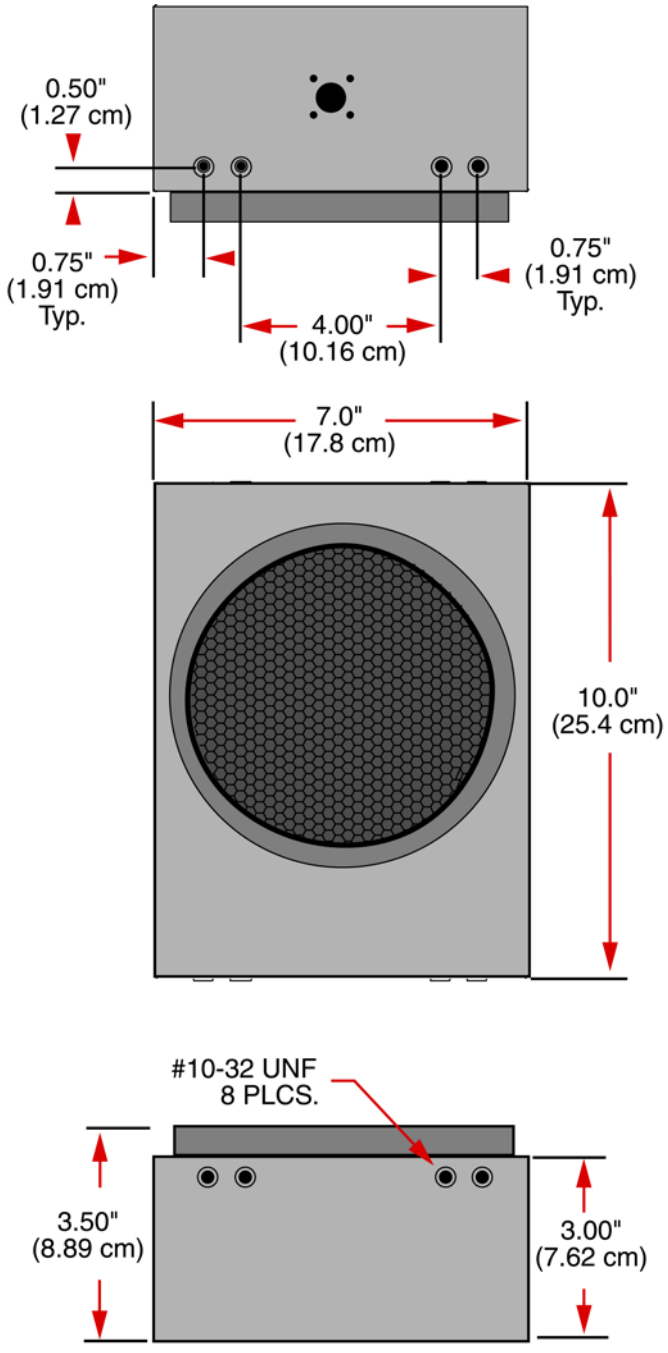
EN-604W-xx

6.5 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-607W-xx.



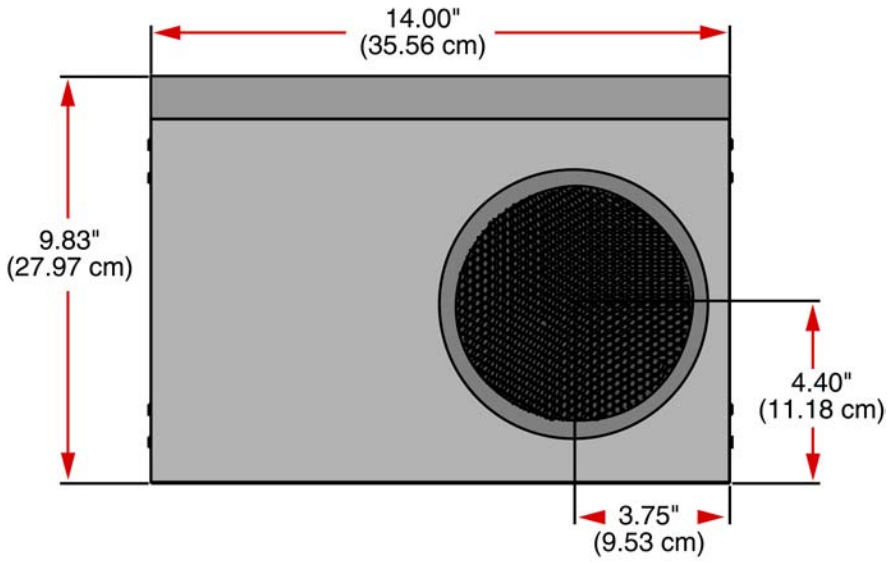
EN-607W-xx

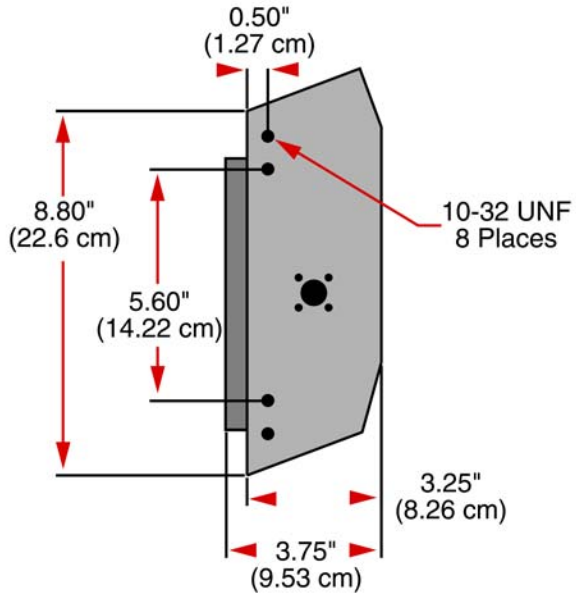
6.6 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-608W-xx.



EN-608W-xx

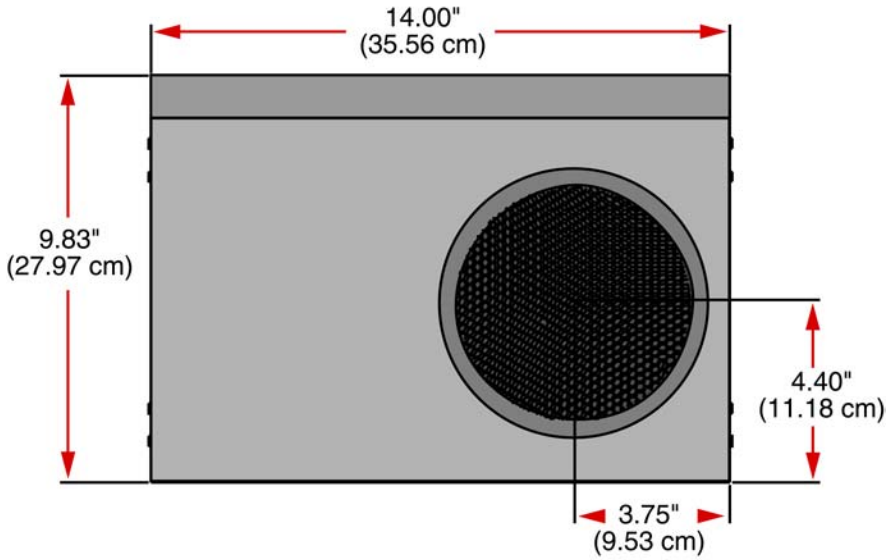
6.7 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-609W-xx.

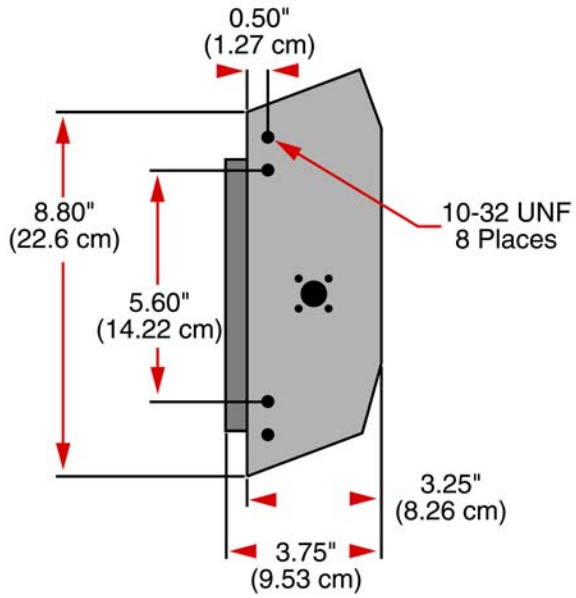




EN-609W-xx

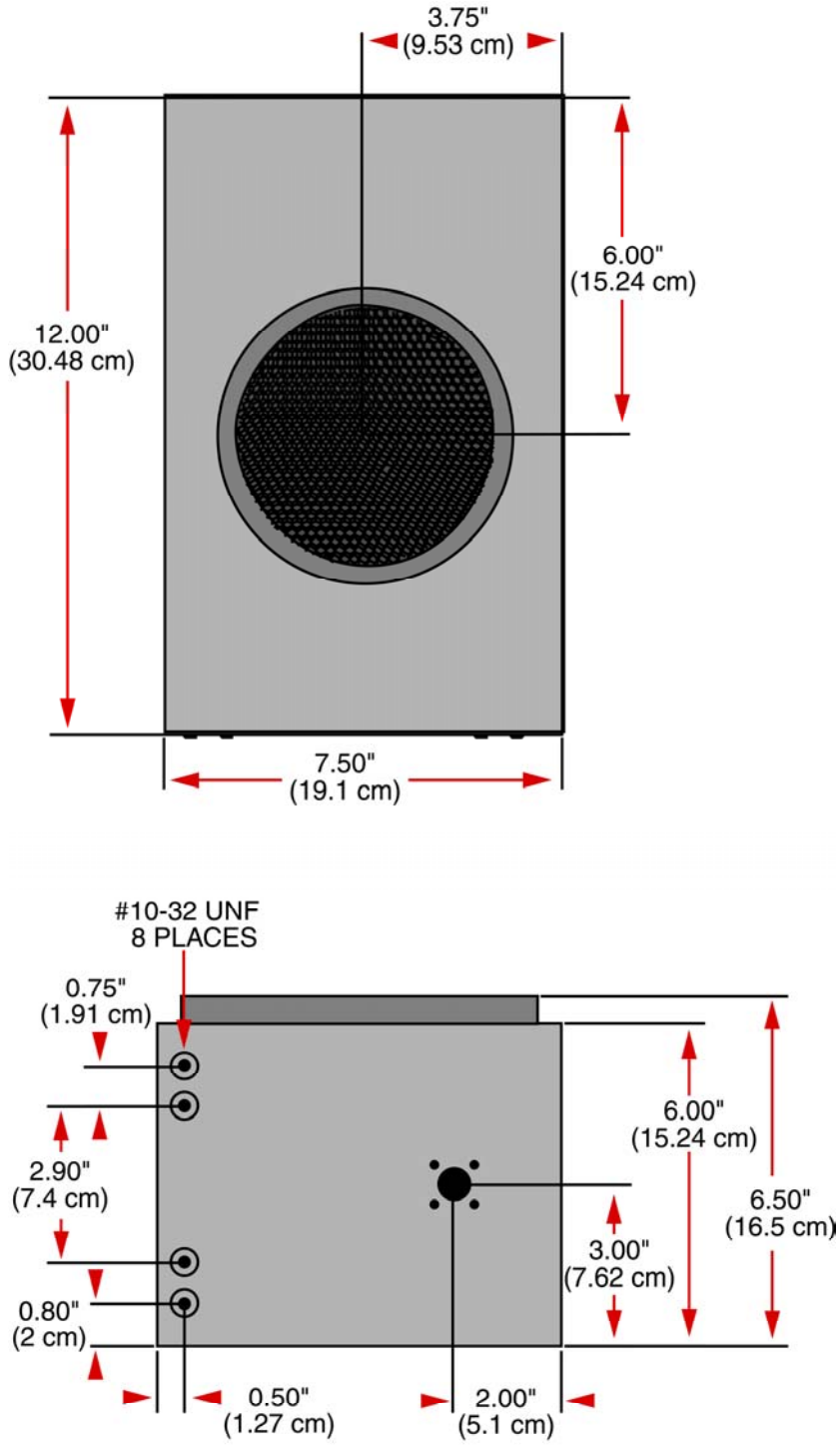
6.8 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-610W-xx.





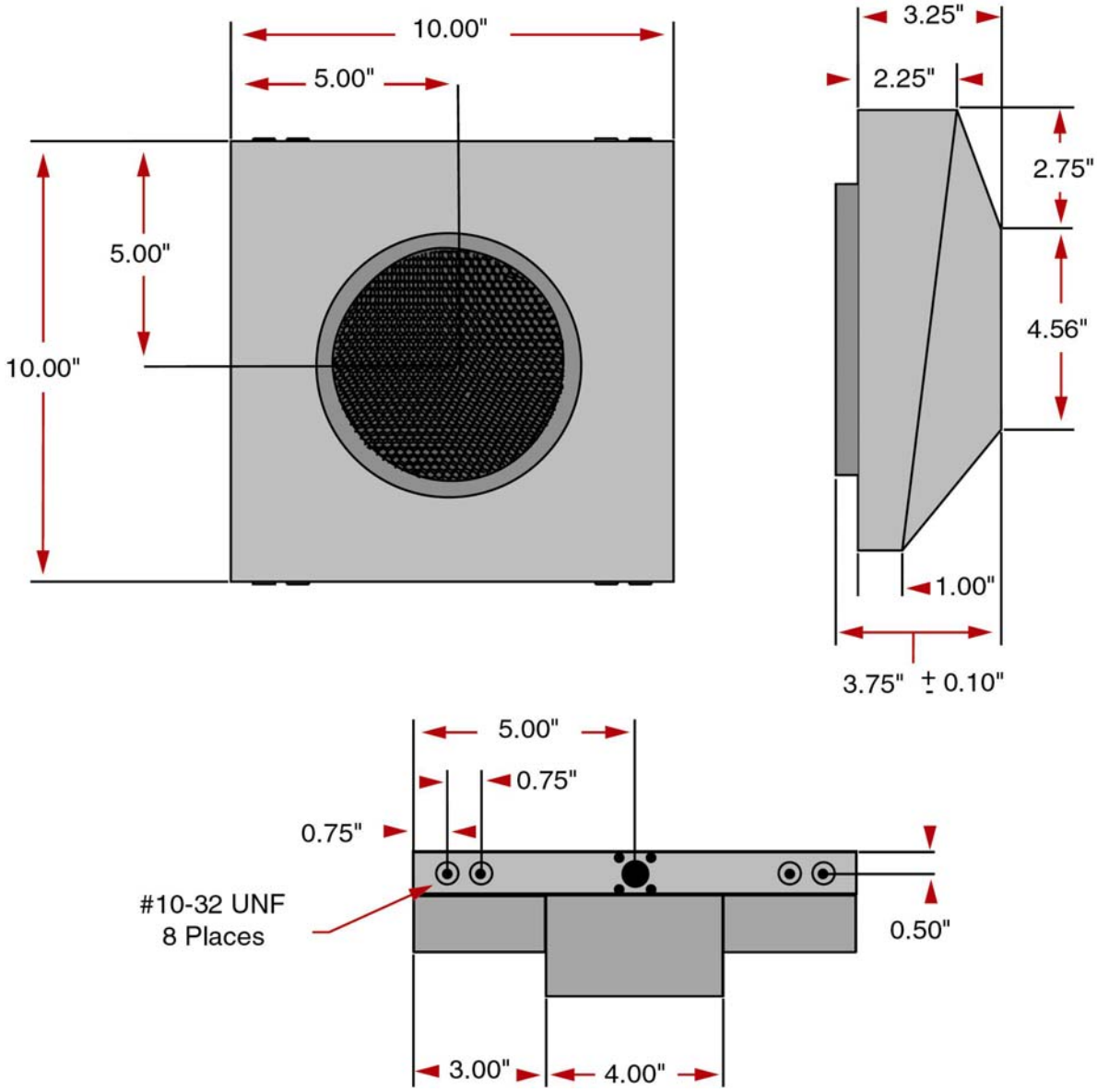
EN-610W-xx

6.9 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-611W-xx.



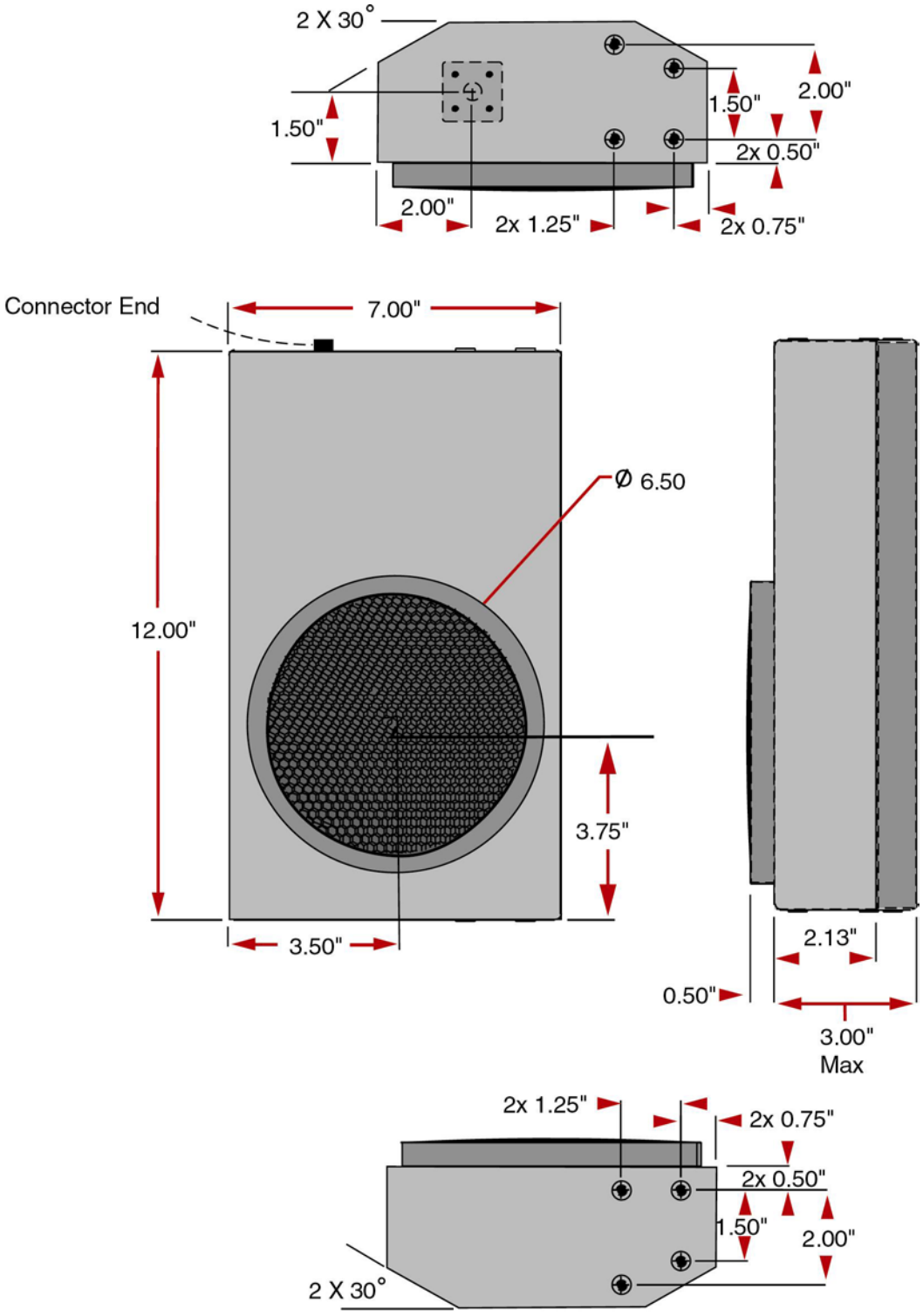
EN-611W-xx

6.10 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-612W-xx.



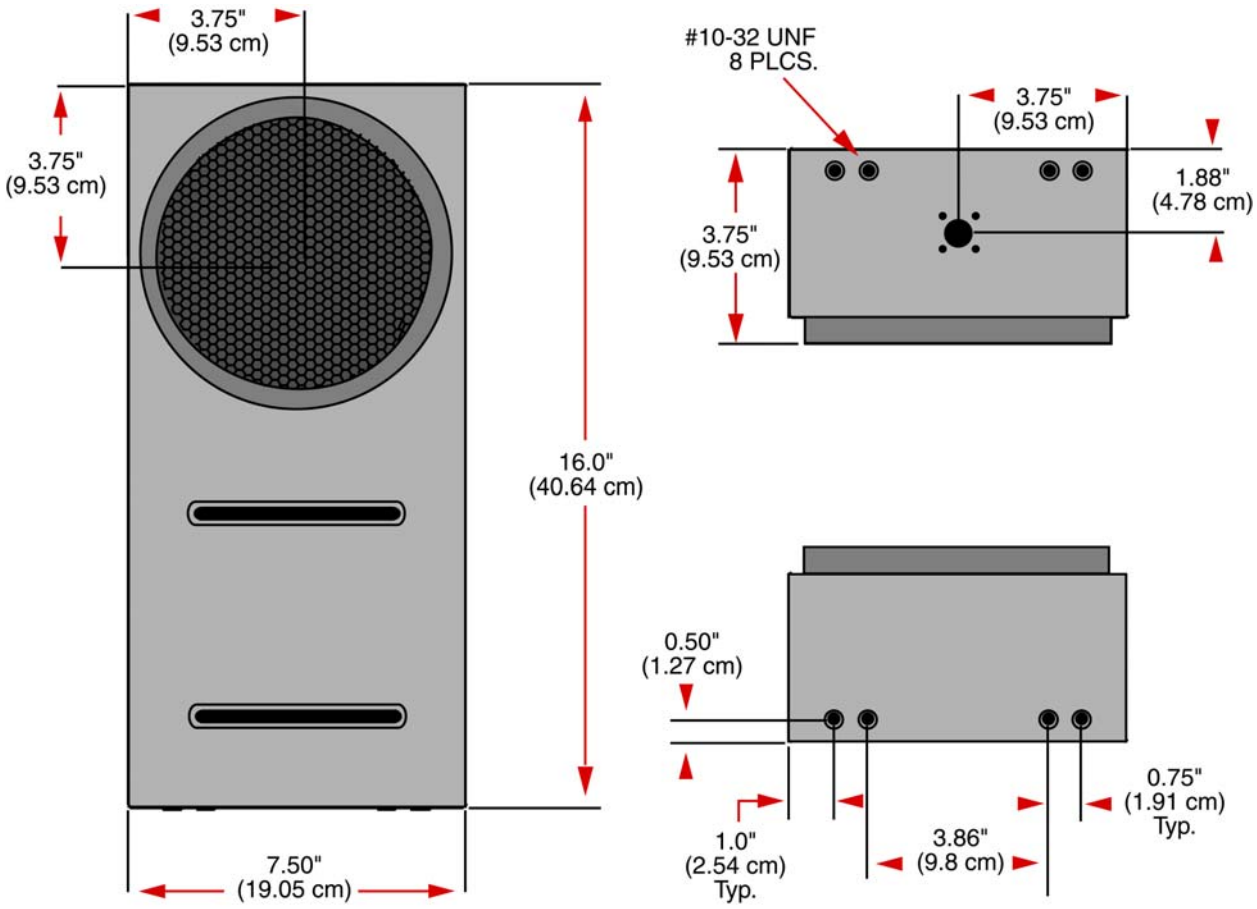
EN-612W-xx

6.11 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-620W-xx.



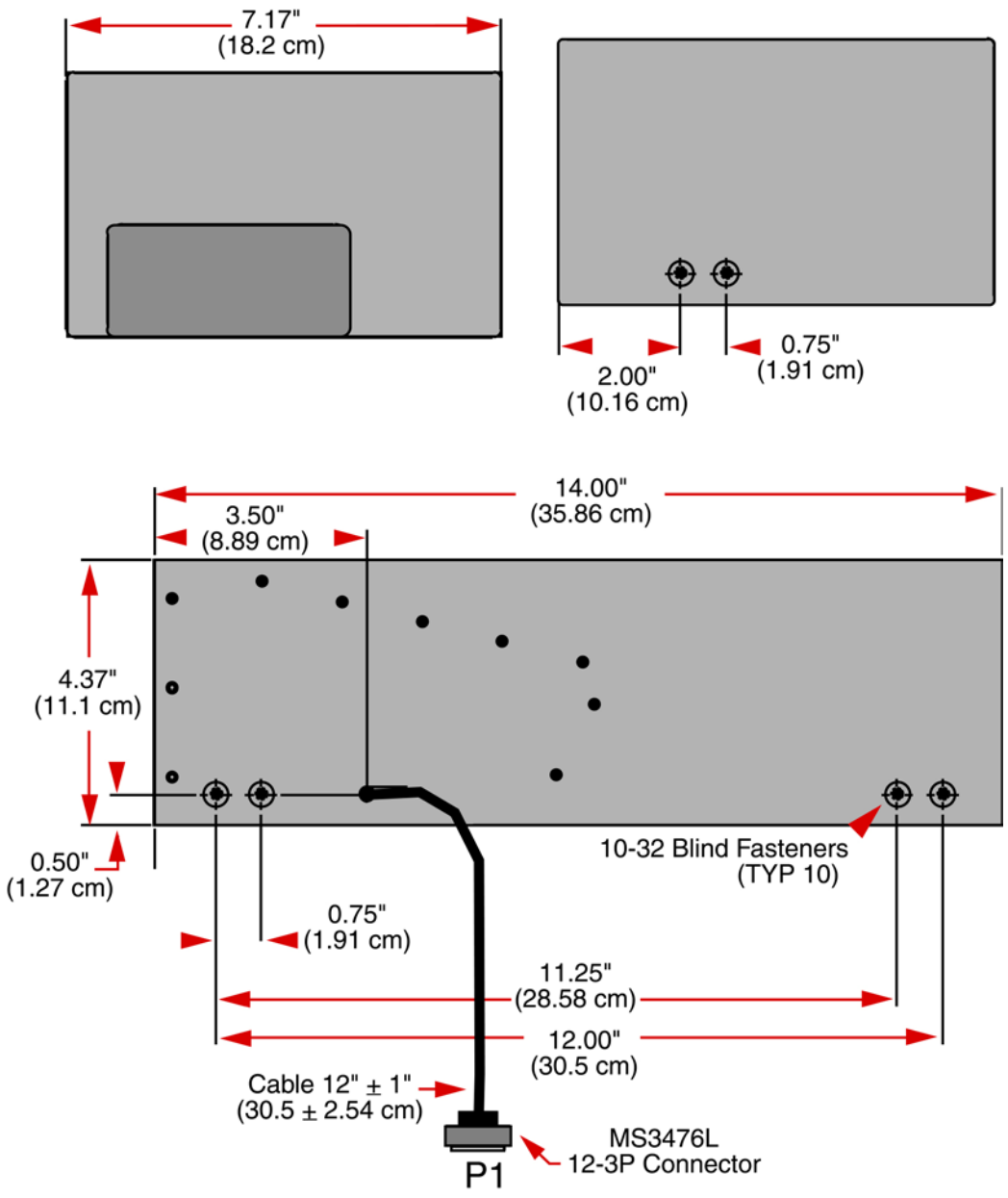
EN-620W-xx

6.12 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-621W-xx.



EN-621W-xx

6.13 The following diagrams show the unit dimensions, mounting locations, and connector locations for the EN-646W-xx.



EN-646W-xx